

structure, and the carbonaceous material has a true density of 1.8 g/cm^3 or more and a peak in powder X-ray diffraction which corresponds to not more than 0.340 nm in an interplanar spacing d_{002} derived from (002) reflection (Takami '544, col. 2, lines 60-65).

The positive electrode of Takami '544 can be any of various kinds of oxides, such as manganese dioxide, lithium/manganese composite oxide, lithium-containing nickel oxide, lithium-containing cobalt oxide, lithium-containing nickel cobalt oxide, lithium-containing iron oxide and lithium-containing vanadium oxide; or chalcogen compounds such as titanium disulfate or molybdenum disulfate. Among them, lithium cobalt oxide {for example, Li_xCoO_2 ($0.8 \leq x \leq 1$)}, lithium nickel oxide (for example, LiNiO_2) and lithium manganese oxide (for example, LiMn_2O_4 , LiMnO_2) are preferable in view of obtaining a high voltage (Takami '544, col. 4, lines 39-49).

The January 14, 2005 Office Action contains an acknowledgment that Takami '544 does not contain disclosure as to the recitation in claims 1 and 17 relating to the water content of the electrodes, namely, that:

a cumulative concentration of water (H_2O) released from both of said positive electrode and said negative electrode in relation to the weight of said electrode unit, exclusive of weight of current collectors, is suppressed to 5,000 ppm or lower in case of heating both electrodes at 25 to 200°C and to 1,500 ppm or lower in case of heating said electrodes at 200 to 300°C .

Watanabe '644 discloses a non-aqueous electrolyte secondary battery which uses Li_xSiO_y as the negative electrode active material and $\text{Li}_x\text{Ti}_y\text{O}_4$ or Li_xFeS_y as the positive electrode active material (Watanabe '644, Abstract).

Watanabe '644 contains no suggestion that any of the features disclosed therein which relate to avoidance of moisture would provide any benefit in batteries which do not employ

positive and negative active materials as disclosed in Watanabe '644. Watanabe '644 discloses that it is desirable that "*the battery of the present invention*" be assembled in a moisture-free atmosphere or an inert gas atmosphere. Watanabe '644 contains no suggestion that any benefit would be produced by following the disclosure in Watanabe '644 unless the electrodes of the battery correspond to those described in Watanabe '644, namely, Li_xSiO_y as the negative electrode active material and $\text{Li}_x\text{Ti}_y\text{O}_4$ or Li_xFeS_y as the positive electrode active material.

Any assertion that Watanabe '644 suggests reducing moisture content in *all* lithium secondary batteries, regardless of the electrode active materials, would clearly go beyond what is disclosed in Watanabe '644.

The materials disclosed in Watanabe '644 for use as the positive and negative electrodes do not include any materials disclosed in Takami '544 for use as the positive and negative electrodes of Takami '544.

The Office Action refers to U.S Patent No. 6,361,822 (Kurose '822). Kurose '822 is directed to a method for producing an electrode for a non-aqueous electrolyte battery, and more particularly, to a method for producing a non-aqueous electrolyte battery electrode which includes an electrode active material layer containing at least an active material having a composition of $\text{Li}_x\text{Ni}_y\text{M}_z\text{O}_2$ (where x satisfies $0.8 < x < 1.5$, $y+z$ satisfies $0.8 < y+z < 1.2$, z satisfies $0 \leq z < 0.35$, and M is at least one element selected from Co, Mg, Ca, Sr, Al, Mn and Fe).

Kurose '822 does not contain disclosure which would suggest to one of skill in the art that disclosure in Watanabe '644 about the electrodes therein would be broadly applicable to *all* electrodes. As noted above, Watanabe '644 discloses a battery in which a negative electrode active has the compositional formula Li_xSiO_y , and a positive electrode active material is represented by the general formula $\text{Li}_x\text{Ti}_y\text{O}_4$ or Li_xFeS_y .

The January 14, 2005 Office Action contains a statement that “Kurose specifically identifies ‘nickel-containing lithium composite oxides’ as ‘tend[ing] to absorb moisture’” and that nickel-containing lithium composite oxides “can be considered to be substantially equivalent to LiMn_2O_4 .”

The Applicants respectfully disagree with the U.S. PTO, because, as demonstrated by the attached Declaration Under 37 C.F.R. §1.132, nickel-containing lithium composite oxides do not behave in a manner anywhere near equivalent to LiMn_2O_4 . In this Declaration, in Experiment 1, electrolyte solution was heated in order to analyze the amount of HF contained in the respective electrolyte solutions after heating. In Experiment 2, respective positive electrode materials (LiNiO_2 and LiMn_2O_4) were placed in respective electrolyte solutions, and the electrolyte solutions were then heated as in Experiment 1, after which the amount of transition metal in the electrolyte solution was detected. Experiment 1 demonstrates that HF is generated by heating the electrolyte solution, similar to the way in which HF is generated by addition of water into the electrolyte solution. HF is believed to enhance the dissolution of transition metals. Table 2 shows that the rate of dissolution of Mn from LiMn_2O_4 is much higher than the rate of dissolution of Ni from LiNiO_2 , indicating that the amount of dissolution of transition metal into the electrolyte solution strongly depends on the type of positive electrode material (i.e., whether it is LiNiO_2 or LiMn_2O_4).

It is respectfully submitted that entry of the attached Declaration Under 37 C.F.R. 1.132 at this stage of prosecution would be proper because the Declaration refutes a technical assertion contained for the first time in the January 14, 2005 Final Office Action.

In addition, neither of the applied references contains any indication that the battery of Takami ‘544 could be made to have the water content properties disclosed in Watanabe ‘644, unless the battery includes a negative electrode active material of lithium-containing silicon oxide represented by the compositional formula Li_xSiO_y , and a positive electrode active

material of lithium-containing titanium oxide represented by the general formula $\text{Li}_x\text{Ti}_y\text{O}_4$ or lithium-containing iron sulfide represented by the general formula Li_xFeS_y .

In view of the above, it is respectfully requested that the U.S. PTO reconsider and withdraw this rejection.

Based on the above, claims 1-17 are in condition for allowance.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,



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